

# Claims

- [c1] A method for maintaining an interconnection grid array of an electronic module while engaging said electronic module to another structure comprising:
- providing said electronic module mounted to a circuit board;
  - positioning a loading block at a backside of said circuit board;
  - providing a spring having a plurality of securing means;
  - positioning said spring adjacent said loading block;
  - engaging a fastening means within said spring such that said fastening means is aligned to said loading block;
  - and
  - actuating said fastening means to apply pressures to said loading block in a location corresponding to a center of said interconnection grid array to maintain integrity of said interconnection grid array, while simultaneously applying pressures to said securing means for engaging said electronic module to said another structure.
- [c2] The method of claim 1 wherein upon said step of actuating said fastening means:

said pressures being applied to said loading block, forcing said loading block against said backside of said circuit board in said location for generating central backside compressive forces for directing an area of highest compressions to said center of said interconnection grid array for maintaining said integrity of said interconnection grid array, and simultaneously, said pressures being applied to said spring, said pressures on said spring being transferred to said plurality of securing means for engaging said electronic module to said another structure.

- [c3] The method of claim 1 wherein said electronic module includes a chip and a chip carrier, said chip being in contact with said chip carrier while said interconnection grid array is positioned between said chip carrier and said circuit board, said loading block being positioned at said backside of said electronic module in contact with said circuit board whereby said central backside compressive forces maintain integrity of said circuit board.
- [c4] The method of claim 1 wherein said another structure is selected from the group consisting of a circuit board, an electronic component, a semiconductor component, and a thermal component.
- [c5] The method of claim 1 wherein said loading block has a

plurality of legs, said loading block being positioned so that said plurality of legs are directed toward said circuit board, and each of said plurality of legs reside substantially equidistant to said center of said interconnection array.

- [c6] The method of claim 5 wherein said loading block has an even number of legs, wherein each of said legs is positioned on said loading block symmetrically and equidistant with respect to each other.
- [c7] The method of claim 5 wherein said loading block has an odd number of legs, wherein each of said legs is positioned on said loading block symmetrically and equidistant with respect to each other.
- [c8] The method of claim 1 wherein said spring comprises an x-spring.
- [c9] The method of claim 1 wherein said loading block comprises a rigid table having outwardly extending legs.
- [c10] The method of claim 1 wherein said loading block comprises a plate having centrally located upwardly extending protrusions integrally formed with said plate.
- [c11] A method for maintaining an interconnection grid array interconnecting an electronic module to a circuit board

while engaging said electronic module to a heat sink comprising:

providing an electronic module having a chip carrier and a chip mounted to a circuit board via an interconnection grid array;

positioning a loading block having a plurality of legs at said backside of said circuit board in a location corresponding to a central area of said interconnection grid array;

providing a spring having a central opening and a plurality of peripheral openings;

engaging a plurality of securing means within said plurality of peripheral openings of said spring;

engaging a fastening means within said central opening of said spring;

positioning said spring under said loading block such that said fastening means is centrally aligned with said loading block and said plurality of securing means are aligned with and traverse through corresponding openings in said circuit board;

applying pressure simultaneously to said loading block and said spring by actuating said fastening means,

whereby said pressure on said loading block forces said plurality of legs of said loading block against said circuit board to generate central backside compressive forces directed at said central area of said interconnection grid

array, while said pressures on said spring are transferred to said plurality of securing means to engage said plurality of securing means within said heat sink for coupling said heat sink to said chip, thereby maintaining integrity of said interconnection grid array.

[c12] The method of claim 11 wherein each of said plurality of legs are in contact with said circuit board in locations that are substantially equidistant with respect to a center of said interconnection grid array.

[c13] The method of claim 11 wherein said interconnection grid array comprises a solder interconnection array of a plurality of solder joints, each having original shapes, said method substantially maintaining said original shapes of said plurality of solder joints.

[c14] The method of claim 11 wherein only said fastening means and said securing means directly contact said spring, thereby preventing any distortions to said circuit board during said method.

[c15] The method of claim 14 wherein only said loading block contacts said circuit board.

[c16] The method of claim 11 further including a cushioning material between selected legs of said plurality of legs to provide a planar contact between said plurality of legs

and said circuit board for evenly distributing said central backside compressive forces across said loading block and said interconnection grid array.

[c17] The method of claim 11 wherein said plurality of legs of said loading block reside in an area having a perimeter equivalent to or smaller than perimeters of both said chip and said interconnection grid array.

[c18] A clamping assembly for engaging an electronic module to another structure comprising:  
an electronic module mounted to a circuit board via an interconnection grid array;  
a loading block having a plurality of legs, said loading block positioned at a backside of said electronic module, toward said circuit board, in a location corresponding to a central area of said interconnection grid array;  
a spring having a central opening and a plurality of peripheral openings equidistant from said central opening, said spring being adjacent said loading block without contacting said electronic module or said circuit board;  
a plurality of securing means engaged within said plurality of peripheral openings of said spring; and  
a fastening means engaged within said central opening of said spring, said fastening means being centrally aligned with and in contact with said loading block, whereupon said assembly generates central backside

compressive forces that direct said loading block against said circuit board in said location corresponding to said central area of said interconnection grid array such that integrity of said interconnection grid array is maintained, while said plurality of securing means engage said electronic module to said another structure.

[c19] The assembly of claim 18 wherein said loading block comprises a planar plate having said plurality of legs integrally formed therewith.

[c20] The assembly of claim 18 wherein said loading block comprise a rigid structure having outwardly extending legs.